In accordance with a feeling expressed many times, I have arrived at the conclusion that it is not by the institution of new prizes with the conditions of award fixed beforehand that the cause of scientific progress can be served most effectively. Undoubtedly it is an excellent thing to reward good work, but it is of greater importance to encourage the growth of original investigation by removing those obstacles which are apt to paralyse the peace of mind of men engaged in research work, of which the principal is generally the question of ways and means.

Impelled by this idea, I created in 1908 the Fonds Bonaparte. Anxious to continue this work, I am placing at the disposal of the academy a further sum of 250,000 francs, not as a capital sum, but in the form of five annuities, intended to be used at once in the spirit I have indicated; that is to say, putting aside all idea of recompense for work accomplished already, whatever its merit may be, my wish is that this sum may be used to stimulate discoveries by rendering easier the researches of workers in science who, having already given proof of their ability to undertake original work, and not belonging to our academy, lack sufficient resources to undertake or to follow out their investigations.

I therefore ask the academy to allocate in 1912, 1913, 1914, 1915, and 1916 these new annuities in the same manner that it has already, in previous years, dealt with the earlier annuities of the Fonds Bonaparte.

Devoted as I am to all scientific studies, I shall be happy, and my object will be gained, if I can in this way help to increase the amount of positive knowledge.

The president said:—

I do not think I need ask the academy to give its approval to this further liberality that Prince Roland Bonaparte offers us to-day. The academy accepts the gift with gratitude.

Not satisfied with continuing to help, as he has done for the last four years, young men of science who might have been stopped in their researches by material difficulties, our colleague doubles the amount which he places at their disposal by making it 50,000 francs a year for five more years. The number and value of the researches which his gifts have made possible during the four years which are almost at an end lead us to hope that the results will be still better for the new period which begins in 1912.

With its president, the academy and French science thank Prince Roland Bonaparte very heartily for his generosity and invaluable initiative.

NOTES.

We notice with deep regret the announcement of the death, on Sunday, December 10, at ninety-four years of age, of Sir Joseph D. Hooker, O.M., F.R.S. In the scientific world he occupied a place in the front rank, and his name and work will be permanently prominent in the history of scientific progress in modern times. Thirty-four years ago, on October 25, 1877, an appreciative article on his services to science was contributed to our columns by Prof. Asa Gray in the eleventh article of our series of Scientific Worthies. We need only refer to that article now as an indication of the high esteem in which Sir Joseph's unusual gifts and energies have long been held by those most competent to estimate their value. We hope in our next issue to supplement this article with another, and here only remark that his botanical knowledge was unrivalled, and his work has won the gratitude of the whole civilised world. The announcement was made on Tuesday that the Dean of Westminster had, with the full concurrence of the Chapter, offered to the family to permit the interment of Sir Joseph Hooker's ashes in the Abbey, on the condition that his remains were previously cremated. It would have been appropriate for his remains to rest in the north aisle of Westminster Abbey among those of Newton, Sir John Herschel, Darwin, and Kelvin, and near the memorials of Adams, Stokes, and Joule. The family has, however, felt obliged to decline the offer of burial in the Abbey, as it was Sir Joseph's express wish that he should be buried by the side of his father at Kew. The funeral will therefore take place at Kew Parish Church to-morrow (Friday) at two o'clock. It is specially requested that no flowers be sent.

The list of honours conferred by the King on the occasion of his Majesty's visit to India, and in commemoration of the Coronation, is published in a supplement to *The London Gazette* of December 8. Among the names in the list are those of several people concerned with scientific work. We notice the following in a long list of appointments and promotions:—*K.C.S.I.:* Surgeon-General C. P. Lukis, Director-General, Indian Medical Service. *C.S.I.:* Colonel S. G. Burrard, F.R.S., Officiating Surveyor-General of India; Mr. F. B. Bryant, Inspector-General of Forests to the Government of India; Dr. G. T. Walker, F.R.S., Director-General of Indian Observatories; Prof. J. C. Bose, Presidency College, Calcutta. *K.C.I.E.:* Mr. Eardley-Wilmot, lately Inspector-General of Forests to the Government of India. *C.I.E.:* Major Leonard Rogers, professor of pathology, Medical College, Calcutta, and bacteriologist to the Government of India; Mr. H. H. Hayden, Director of the Geological Survey of India. *Knights Bachelor:* Mr. R. P. Ashton, president of the Mining and Geological Institute, Calcutta; Lieut.-Colonel C. H. Bedford, Chemical Examiner, Bengal.

The Nobel prizes were distributed by the King of Sweden on December 10. Three of the prize-winners—Mme. Curie (chemistry), Prof. W. Wien (physics), and Prof. A. Gullstrand (medicine)—were present personally to receive their prizes.

We regret to announce the death, on December 11, after a very short illness, of Mr. William Thynne Lynn. The son of a physician in Westminster Hospital, he was born at Chelsea in 1835. He was for a short time assistant in the Cambridge Observatory, and was assistant at the Royal Observatory, Greenwich, from 1856 to 1880, when he retired from official duties. He was elected a fellow of the Royal Astronomical Society in 1862, and contributed several papers to the Monthly Notices. In 1900 he became a member of the British Astronomical Association, was the author of many papers in its Journal, and was a member of the council at the time of his death. He was associated with Prof. D. P. Todd in the authorship of "Stars and Telescopes," and, among other works, wrote the popular little treatises "Celestial Motions," "Remarkable Comets," and "Remarkable Eclipses," each of which ran through several editions. He was a constant contributor to *The Athenaeum*, *Observatory*, and other journals, principally on subjects connected with the history of astronomy and the calendar, and occasionally contributed to our pages. His knowledge of astronomy generally, and especially of its history, was unusually extensive. On subjects connected with chronology he was also extremely well informed, and was always ready to place his knowledge at the service of others.

We regret to learn of the death of Mr. H. Snowden Ward, which took place in New York about a week ago, after an exceedingly short illness. Mr. Snowden Ward was a journalist and publisher who was well known in this country as being energetically interested in all branches of photography, but especially in the progress of methods of photomechanical reproduction, and, later, in the advance of pictorial photography. His endeavour to get the word photograph, when used as a substantive, replaced by "photogram," which he maintained was more correct, was always kept to the front by the name of his monthly journal *The Photogram* and his annual "Photograms of the Year." Of late years Mr. Snowden Ward, while continuing his journalistic work, studied the life and writings of Charles Dickens, with special reference to the actual places and circumstances referred to by the novelist. He was giving lectures on this subject in the United States when he was taken ill. He was only forty-six years of age.

THE death is announced, at fifty-two years of age, of Dr. E. F. Trevelyan, formerly professor of therapeutics at the University of Leeds, and professor of pathology at the Yorkshire College, then a constituent of the Victoria University.

PROF. G. ELLIOT SMITH, F.R.S., professor of anatomy in the University of Manchester, has been awarded by the Paris Anthropological Society the Prix Fauvelle, of one thousand francs, for his researches in the anatomy and physiology of the nervous system.

PROF. F. B. LOOMIS, who left Amherst College, Mass., in July at the head of an exploring expedition to Patagonia, has written to a colleague an outline of his progress up to the beginning of October. He had not been able to secure many fossils, but could already see that the expedition would be able to revise the geology of the country traversed. Many of the beds previously described as land deposits were, in his judgment, marine.

THE death is announced, on December 5 at Gloucester, in his seventy-eighth year, of Dr. Francis T. Bond, for thirty-eight years medical officer to the Gloucestershire combined sanitary district. Dr. Bond was formerly professor of clinical medicine at Queen's Hospital, Birmingham. From 1862 to 1873 he was principal of the Hartley Institute, Southampton. He translated Radicke's work on "Medical Statistics," and was a frequent contributor to medical and sanitary journals. Dr. Bond was an early worker in bacteriological research and was interested in scientific agriculture; he elaborated a method of cheese manufacture, and invented a filter and other hygienic devices.

THE presentation of the testimonial to Mr. Henry Keeping on his retirement from the post of curator of the Geological Museum, Cambridge, took place in the Sedgwick Museum on Saturday, December 2, when Prof. T. McKenny Hughes handed him a purse subscribed by old friends and students in recognition of his long and valuable services. Mr. Keeping entered upon his duties as curator fifty years ago under Prof. Sedgwick in the old Woodwardian Museum, where the geological department was located until its removal into the Sedgwick Museum in 1904. In collecting fossils in the field Mr. Keeping has displayed exceptional ability and skill; and amongst the mass of specimens which he has thus added to the museum special mention should be made of the remarkably rich series of Tertiary fossils from the Hampshire basin which his keen eye and intimate knowledge of the beds of that area have enabled him to obtain.

AN interesting discovery is reported from Western Canada. During the summer Mr. Andrew Gordon French discovered what is claimed to be one of the largest mines of reef platinum metals in the world in the dyke rocks of the Nelson district, British Columbia. He has now announced the discovery therein of a new element, to which he has given the name Canadium. The element is described as a new member of the family of noble metals, with a melting point somewhat lower than that of silver and gold, possessing a brilliant white lustre, easily soluble in hydrochloric and in nitric acids, not tarnished by damp air, sulphuretted hydrogen, alkaline sulphides, or tincture of iodine, and not precipitated from its solutions by chlorides or iodides. Continued heating in the oxidising flame does not oxidise the molten metal, though some specimens, when first heated, give off dense fumes, which may be due to osmium, or possibly to something also new. It is electronegative to silver, is precipitated from its solutions by zinc, and, when alloyed with lead, may be separated by cupellation. The metal occurs pure as semicrystalline grains, and in short rods about 0·5 mm. long and 0·1 mm. thick, and also alloyed with the other platinum metals. Quantities up to 3 oz. per ton have been found in the rock. It is more brilliant and lustrous than palladium, and softer than platinum, ruthenium, and osmium. The new metal is thus well characterised and clearly differentiated in properties from all known substances, and the confirmation of the discovery will be awaited with interest. Mr. French has had wide practical experience in the extraction and separation of the platinum metals with various bullion-smelting firms in this country, and is a native of Glasgow.

MR. J. C. ROBERTSON, of 119 Victoria Road, Kirkcaldy, has sent us a communication relating to recent proposals for the reform of the calendar. For the most part his remarks add little to the information conveyed in our articles of April 27 and October 26. But he also takes occasion to advocate the setting back of the year by ten days in order that its beginning may coincide with the winter solstice. This suggestion cannot be supported on the ground of any advantage in commercial affairs, and the chief interest which it has for us lies in the light which it throws on the mental attitude of the prominent reformers. In criticism of the provisions of the Fixed Calendar Bill, we suggested the case of a servant engaged on March 32, and wished to know the date of the first monthly payment and the rule for calculating its amount. On the first point Mr. Robertson confirms our surmise that the due date is April 28. This, it may be observed, implies that in practice a month may be any period from twenty-eight to thirty-five days—a truly great improvement on our present system! He then suggests that the payment will be by special agreement one-twelfth of the annual wage. But again it is difficult to appreciate the simplicity of a calendar which needs to be supplemented by special agreements. Alternatively, he states that the Bill provides that the payment shall be in proportion to the length of service. We believe that according to the Bill payment should be in proportion to the number of weeks in the month. When, as in the case suggested, a fraction of a week is involved, we were at a loss for a rule, and Mr. Robertson has not convinced us that the Bill is explicit on the point. We have no wish to press this simple example too far, but we do think that the reformers have altogether underrated the practical difficulties of the problem and undervalued the legitimate objections which can be brought against their solution of it.

MR. HERON-ALLEN informs us that the violent gales at the end of November have enabled him to make two very remarkable finds at Selsey, near Chichester. One is a series of Proteoliths in the seldom exposed Pleistocene mud bed on the west coast, which Sir Ray Lankester pronounces to be of the rostro-carinate eagles's-beak form, similar in shape and date to the sub-Crag Proteoliths of which frequent mention has been made in these pages. Mr. Heron-Allen is handing them all over, together with the Selsey Palæoliths and Mesoliths, to Sir Ray Lankester, who is at work on this subject. The other "find" is a British gold stater, dished and plain on one side, and bearing on the other the impress of a die not to be found in Willett's or Evans's works, and which, until Mr. Heron-Allen deposited his coin at the British Museum, was unknown and unrepresented in the national collection.

In describing (*Archaeologia Æliana*, ser. 3, vol. vii.) the animal remains obtained during the excavations on the site of the Roman city of Corstopitum, near Newcastle-upon-Tyne, in 1910, Messrs. A. Meek and R. A. H. Gray state that the bones and skulls of many of the oxen agree very closely with those of the white cattle of Chillingham and other British parks. A peculiarity said to characterise both is the absence or early shedding of the antepenultimate lower premolar. On this ground both the Chillingham and the Roman cattle are declared to represent a new wild species, for which the name *Bos sylvestris* is proposed; but whether this is typified by the former or the latter the reader is left to decide for himself. They ignore the fact that park-cattle already possess a scientific name —*Urus scoticus* of Hamilton Smith—and likewise that the colour of these cattle is decisive as to their domesticated origin. Most naturalists would likewise regard the alleged absence of the anterior premolar as a feature due to domestication.

In a study of the Pacific Ocean in its relation to ethnography, contributed by Dr. J. M. Brown, regent of the University of New Zealand, to part i., vol. ii., of *The Journal of Race Development*, the writer lays special stress on the region of subsidence. This he believes to account for one of the most singular phenomena in human culture. "These central groups are occupied by a people, the Polynesians, who in some of their arts, the masculine, those of war, navigation, architecture, and carving, rise to the highest levels of the barbaric stage. And yet they have adhered to arts that are purely Palæolithic: these are the art of thread-making, that of fire-making, and the fictile art; they have never had a spindle: they have a pump-drill, but they have never applied it to the production of fire; and though they have plenty of clay, they have never made pottery. In early stages of culture these belong to the women's department, and woman, guided as she is by emotion oftener than by reason, is more conservative than man. This Palæolithic element in the household culture seems to indicate that man has been in Polynesia since Palæolithic times, and that woman came into those regions only in those times, when there were still only short canoe voyages to make to land that could be seen on the horizon."

Nos. 46 and 47 of the Scientific Memoirs of the Government of India deal respectively with "Malaria in the Punjab," by Major Christophers, and "Dysentery and Liver Abscess in Bombay," by Major Greig and Captain Wells. Malaria in the Punjab is manifested in two ways, as "endemic malaria" and as "autumnal epidemic or fulminant malaria," the latter—the more important—being associated with a high mortality. The determining causes of epidemics are excessive rainfall and scarcity, though the epidemic areas are not necessarily coincident with those of heaviest rainfall. The determining factor of epidemic and fulminant malaria is found to be flooding, and the villages are attacked almost exactly in proportion as they have been flooded. Experiments with sparrows and the Proteosoma, a parasite analogous to the malaria parasite of man, and similarly conveyed by mosquitoes, show that severity of infection is largely dependent on the dose inoculated, and the latter depends not merely on the number of mosquitoes biting, but on the number of sporozoites injected at each bite, and this, again, depends on the richness in parasites of the blood of the individual from whom the mosquito derives the infection. The memoir contains a number of plans and illustrative charts. As regards Memoir 47, on dysentery, though bacillary dysentery occurs in Bombay, it is infrequent, and the form associated with amœbæ is more prevalent. The prevalence of amœbæ shows a marked seasonal variation, which follows the humidity, and not the temperature, curve in Bombay. The amœbæ can be cultivated, and are not *Ent. histolytica* or *coli*, but are probably the same form as that observed by Noc in Cochin China. Apparently the same amœbæ can be cultivated from tap water in the districts, and the evidence at present available indicates that water is probably the channel by which this form of dysentery is disseminated.

To vol. iv., part iii., of the Transactions of the Hull Scientific and Field Naturalists' Club, Mr. T. Sheppard contributes notes on the post-glacial, glacial, and pre-glacial faunas of East Yorkshire. The glacial beds have yielded remains of mammoth, straight-tusked elephant, elk, reindeer, red deer, Pleistocene bison, aurochs, rhinoceros, and walrus.

The question of the nature of the diet of the extinct giant phalanger (*Thylacoleo carnifex*) has been incidentally revived by Messrs. Baldwin Spencer and R. H. Walcott in a discussion as to the origin of cuts on bones of extinct Australian marsupials (Proc. R. Soc. Victoria, vol. xxiv., pp. 92–123). Such incised bones occur at considerable depths—sometimes beneath beds of tufa—and the authors consider that the cuts were probably made by the teeth of Thylacoleo. The name given to the giant phalanger by Owen indicated his opinion as to its carnivorous habits; but this view was disputed in 1868 by Sir W. H. Flower, who thought that its diet was probably vegetarian, although it might have included flesh. Thirty years later Dr. R. Broom argued that Owen was right; and if Messrs. Spencer and Walcott are correct in their view as to the origin of the aforesaid cuts, the carnivorous habits of the giant phalanger are definitely proved.

In the volume on mammals in the "Fauna of British India," the late Dr. W. T. Blanford stated that the black-buck (*Antilope cervicapra*) living on a spit of sand between the Chilka Salt Lake, in Orissa, and the sea, never drank, as there is no water on the spit except in deep wells. The statement has been strongly controverted by various writers, one at least of whom has suggested that the antelopes obtain water from sheep-troughs. Of late years it has, however, been conclusively shown that giraffes, kudu, and gemsbok live for a considerable portion of the year in the Kalahari Desert without drinking, obtaining such moisture as they require from the succulent roots of certain plants. In a letter published in *The Field* of November 25 Dr. Drake-Brockman records a very similar instance in the case of the maritime gazelle (*Gazella pelzelni*) in Somaliland. In July, 1910, five of these gazelles were placed on the island of Saad-ud-din, which is absolutely waterless save on the rare occasions when showers fall. There is, however, a succulent Schweinfurthia, of which the gazelles are fond, and a lily with a large onion-like root, which is scraped out of the sand and eaten by the gazelles. These are absolutely the only sources of moisture obtainable by the antelopes, which have now lived on the island for about eighteen months, since it has been clearly proved, by the absence of their tracks from the shore, that they do not drink sea water. The case of the Chilka black-buck accordingly requires reinvestigation in order to ascertain whether they too may be able to obtain moisture from plants.

THE sponge fauna of the Kola-Fjord forms the subject of a paper (with a summary in German) by Mr. L. L. Breitfuss in *Trav. (Comptes rendus) Soc. Imp. Nat. St. Petersbourg*, vol. xlii., part i. In the second fasciculus of the same part Dr. Weltner describes (as the seventh instalment of the account of the fauna of Turkestan) the sponges of the Issyk Kul (Lake Issyk) and the neighbouring rivers of the district north of the Tian Shan. These belong to the almost cosmopolitan *Ephydatia fluviatilis*, and from the fact of its occurrence in the Issyk Kul, which is about 5300 feet above sea-level, at a depth of as much as 40 metres, the species is regarded by the author as a member of the high-mountain and deep-lake fauna. At depths between 15 and 30 metres there was found from the middle of July to the end of August a form which produces sexual buds. Since, however, only a few unripe gemmules with misformed amphidiscs were then found, it is considered that the development of normal sexual gemmules must occur at some other season.

A CATALOGUE of the periodicals, Transactions of societies, and similar publications contained in the library of the Royal Botanic Garden, Edinburgh, has been compiled and published as Nos. xxvi. and xxvii. of "Notes" from the garden. With a view to the utilisation of the separate items as index slips for public or private use, the printing is limited to one side of the page.

A CONTINUATION of garden notes on new trees and shrubs, prepared by Mr. W. J. Bean, appears in *The Kew Bulletin* (No. 8). Chinese introductions include a distinct rough-stemmed bush, *Berberis verruculosa*; a beautiful hornbean, *Carpinus polyneura*; and the new conifer, *Fokienia Hodginsii*. Another interesting and rare Chinese conifer, represented at Kew by several specimens, is the lace-bark pine, *Pinus Bungeana*; a peculiarity of this tree is the white bark, but it is noted that this is a very late development, and has not yet been attained by the Kew specimens. Noteworthy, also, is the small American tree *Leitneria floridana* that by itself constitutes the family Leitneriaceæ; the wood produced is perhaps the lightest known, having a specific gravity about 0·2.

THE original homes of our cultivated plants is a matter of considerable interest to gardeners, so that Mr. A. W. Hill found an appropriate subject in the relation of South America to horticulture for a lecture before the members of the Royal Horticultural Society, that is published in the Journal (vol. xxxvii., part i.). The "monkey puzzle," *Araucaria imbricata*, emanates from Chile, and from that State or Peru have come many hardy or half-hardy shrubs, including *Berberis Darwinii*, *Azara macrophylla*, and *Drimys Winteri*. Less hardy, and therefore requiring greenhouse cultivation, are the climbers Stigmaphyllon and Tacsonia, and the wall plants *Streptosolen Jamesoni* and *Lapageria rosea*. Species of Begonia from South America have contributed materially to the development of modern garden varieties, while no less interesting are the species of Calceolaria and Fuchsia that are strongly represented on that continent, and several brilliant species of Tropæolum.

PROF. D. H CAMPBELL is well known to botanists as the author of many valuable and important memoirs on the morphology of vascular cryptogams. A recent number (No. 140) of the Publications of the Carnegie Institution of Washington embodies a connected account of the eusporangiate ferns, in which he has brought together in a very complete form the result of his researches on the comparative morphology of the Ophioglossaceæ and Marattiaceæ. The memoir, which contains 224 pages of text, and is amply illustrated by text figures and plates, is fully worthy of the high reputation of Prof. Campbell, and it will be indispensable to all students of this interesting group of plants. After an extensive account of the structure and development of a considerable number of species the author draws certain general conclusions as to the phylogenetic significance of the structures he describes. Thus, as a result of a discussion of the evolution of the vascular structure, he regards the vascular system of the stem of, *e.g.*, Marattiaceæ as a collocation of leaf bundles, and discards the "stelar" view, as it is generally held, on the ground that it obscures a right interpretation of the facts. As might have been anticipated, the author deals with the supposed origin of the eusporangiate ferns (which he regards as a primitive group) from a bryophyte stock, and the analogies and comparisons he draws between the embryo of species of Ophioglossum and of Anthoceros are striking. Naturally he does not suggest a derivation of the ferns from Anthoceros as it now exists, but he points out very cogently the remarkable features of resemblance that actually exist. All who are interested in the evidence on which the speculations respecting the ancestry of the higher plants are founded will find matter of great interest in Prof. Campbell's memoir, whilst as a repository of facts which, whatever be the fate of theories and hypotheses, will always retain their face values, the memoir forms a considerable contribution to the permanent literature of botany.

THAT branch of the United States Department of Agriculture concerned with the introduction of foreign seeds and plants has achieved success largely owing to the systematised methods of procedure and the activities of the explorers in charge. One of the latter, Mr. D. G. Fairchild, contributes to *The National Geographic Magazine* (October) a popular illustrated article in which a few of the important introductions are noted. Probably the greatest undertaking has been the importation of date-palm suckers, which have been planted in the States of Arizona and California. From India, mangoes have been imported in large variety, and are being grown in Florida, Porto Rico, and Hawaii. The production of Oriental persimmons and the cultivation of bamboos on a commercial scale are also notable enterprises, as well as the introduction of a new vegetable, "udo," *Aralia cordata*, from Japan, comparable to and said to rival asparagus.

THE report on the permanent experiment field of the Roseworthy Agricultural College, published in *The Journal of the Department of Agriculture of South Australia*, contains some very interesting results. Perhaps the most remarkable is the great increase in the wheat crop obtained by applying small dressings of superphosphates, the grain rising from twenty-one to twenty-six bushels, and the straw also showing a marked increase. Nitrate of soda did not produce anything like the effect that would be looked for in this country, a result probably to be attributed to the lack of moisture, which would operate as a limiting factor. In the same Journal it is also stated that the broom millet (*Sorghum vulgare*, var. *technicum*) can be grown profitably in certain parts of the State. Stress is rightly laid on the value of any new crop likely to widen the basis of the local agriculture. Mention is also made of the fact that varieties of wheat which have proved admirably suited to Australia were wholly unsatisfactory in Great Britain.

The third volume of results published by the Geological and Natural History Survey of Connecticut contains three bulletins, "The Lithology of Connecticut," by Prof. Barrell and Mr. G. F. Loughlin; "Catalogue of Flowering Plants and Ferns of Connecticut Growing without Cultivation," by the Committee of the Connecticut Botanical Society; and "Second Report on the Hymeniales of Connecticut," by Prof. E. A. White. One object of the Survey's publications is to enlist the interest of the general community, in which connection Prof. Barrell's "Introduction to Lithology" is noteworthy for its luminous thoroughness. The economic value of all soils is carefully investigated by Mr. Loughlin. On the same principle, the useful or deleterious properties of flowering plants and fungi receive full notice. Prof. White has made considerable experiments with mushrooms, and the number of edible and wholesome Agaricaceæ is surprisingly large. His descriptions of fungi, illustrated by some excellent photographs, are very complete. The catalogue of flowering plants and ferns comprises 2228 species; nothing that has not been authenticated is included. Distribution is uneven; Connecticut soils, being formed from transported material, often differ from the underlying rock. In the south-eastern portion of the State there is a small group belonging to the flora of the Atlantic coast plain of the middle and southern States, probably a remnant of a larger colony. Among interesting species are the dwarf mistletoe, parasitic on the black spruce; and the numerous representatives of Rhododendron and Cypripedium. In 1907 an Act of the General Assembly was put into force, by which "The Mountain Laurel, *Kalmia latifolia,* is hereby made, constituted, and declared to be the State Flower of the State of Connecticut." The prevailing difficulties of nomenclature are well illustrated in this careful list. It will, in connection with the full geological knowledge of the State, enable some investigations to be made of considerable ecological interest.

Heft 3 of the current volume of the *Mitteilungen aus den Deutschen Schutzgebieten* is mainly devoted to the final portion of an account of the Cameroon Mountains, by Dr. K. Hassert. The hydrography is fully treated, and the distribution of water, with its remarkable inequality, is brought out. The coastal slopes have as high a rainfall as any part of the earth's surface, while the south-eastern, eastern, and northern regions are but imperfectly supplied. The fauna and vegetation are shortly described, and the inhabitants are discussed. A section on the economic products of the region, and two appendices dealing with the observations of altitude and the determination of geological specimens complete the article.

Mr. V. N. Lebedef investigated the hydrology of the Kamchatka River in 1908–9, and has given a preliminary account in the *Izvestiya* of the Russ. Geogr. Soc., Nos. i.–v., 1911. The river is a mighty stream, being more voluminous in its lower course than the Dnieper, and discharging when low fully 42,380 cubic feet of water per second. A greater aggregate of low temperatures is required to bring it to the freezing point than any other river of Siberia, probably owing to the high temperature of the springs that feed it. It receives tribute also from the melting of the snow and ice in the mountains, while rain is of secondary importance. The lakes of eastern Kamchatka are in summer not colder than similar lakes in Europe, notwithstanding the great difference in climate, while in winter they are even warmer, because they are frozen over earlier. The stream that drains the Nerpichye Lake is, unlike most lake outlets, warmer than the air soon after the thawing of the ice. A map of the delta of the Kamchatka River with its numerous islands, channels, and creeks accompanies the article.

Mr. I. Kark, who has studied the Murgab River in relation to a project for storing the surplus water in spring to be used for irrigation in summer has published the results in the *Izvestiya* of the Russ. Geogr. Soc., Nos. viii.–x., 1910. At Tashkepri the minimum discharge of the river in September is 1330 cubic feet a second, and the maximum, in March, 5608 cubic feet, while the annual flow of water is more than 694 thousand million cubic feet. The solid matter carried down by the stream, which silted up a reservoir constructed some years ago at Yolatan, is derived principally from the sand and clay of the löss deposits below Takhtabazar. Below Sultanbent and Yolatan, where the delta may be considered to begin, the load is deposited, and, raising the general level of the country, forces the river to seek a lower course westwards. Hence it is that the town of Merv has moved in the same direction. Mr. Kark suggests that borings should be executed to ascertain the practicability of obtaining water by artesian wells. These borings would also yield information regarding the depth of the solid rocks and their age.

The meteorological chart of the North Atlantic Ocean for December, issued by the Deutsche Seewarte, gives some news received from the German Antarctic Expedition. The ship *Deutschland* left Buenos Ayres on October 7 for a position near latitude 48° S., longitude 30° W., in order to determine by soundings whether a shoal exists there, as surmised by several shipmasters. The vessel would then visit the South Sandwich Islands to explore the floor of the ocean in their vicinity, and afterwards repair to South Georgia to take in stores, &c., this month. From there it would take a direct south-east course to the neighbourhood of Coats' Land, and make the eastern part of Weddell Sea, where less pack-ice is likely to be found than in the south-western corner. If land is reached a station will be established, and the ship will endeavour to get free of the ice by March next. In the southern summer of 1912–13 it will return for the removal of the members of the expedition. Particulars of successful landing on the Antarctic shore may be looked for about April next.

It is impossible to read the monthly issues of the Bulletin of the American Mathematical Society without realising that American mathematicians are a much more powerful and well-organised body than their fellow-workers in this country. In an article on "American Mathematics" in *The Popular Science Monthly*, Prof. G. A. Miller shows that much still remains to be done before America can occupy a position of equality with the leading mathematical centres of the world, and his remarks certainly appear to apply with even greater force to England. It may perhaps be rather doubted whether the imperfect definitions of such words as "matrix" or "algebra" given in ordinary dictionaries can be regarded as affording much conclusive evidence, since it is probable that similar defects might be found in their treatment of other branches of science; but Prof. Miller is on firmer ground when he directs attention to the absence of any popular encyclopædic works of general reference in the English language dealing with the developments and history of higher mathematics. "As the result of this lack of intermediate mathematical literature, comparatively few of our people know what constitutes a mathematician of high order."

The Journal of the Washington Academy of Sciences for November 19 contains a short account of the results obtained by Messrs. Rosa, Dorsey, and Miller in a determination of the ampere in absolute measure at the Bureau of Standards. A current balance of the Rayleigh type was used, a coil being suspended from one pan of a balance so that it hung horizontally between two horizontal fixed coils of double its diameter, the three coils being coaxial. The change of weight in one pan of the balance necessary to maintain equilibrium when the current in the fixed coils was reversed was determined. The absolute value of the chemical equivalent of silver obtained by means of the balance is 1·11804 milligrams per coulomb. The value adopted at the London Conference in 1908 was 1·11800. The electromotive force of the Weston normal cell at 20° C., obtained by sending one absolute ampere through an international ohm, was found to be 1·01822 volts.

AT the recent Karlsruhe meeting of the Naturforscherversammlung Prof. von Kowalski, of Freiburg (Switzerland), gave a summary of our present knowledge of the phosphorescence of organic substances at low temperatures, a knowledge which we owe largely to the observations made by him and his pupils. Many organic substances which exhibit no signs of phosphorescence at ordinary temperatures become phosphorescent in liquid air, and the intensity of the effect is increased if the substance is in solution in water or in alcohol to a concentration of about one-twentieth normal. Subjected to ultra-violet light for an instant, the solid solution gives a continuous phosphorescent spectrum, which gradually fades away, the longer waves disappearing first. If the exposure to the light is continued for a second or more the phosphorescent spectrum shows, in addition, a number of bright bands which persist longer than the continuous spectrum, and in fading away appear to spread themselves over the whole spectrum. These bands are intimately connected with the chemical structure and with the ordinary absorption spectrum of the substance investigated. Their positions can be obtained by displacing the absorption bands through a fixed interval towards the red end of the spectrum.

STUDENTS and teachers of applied mechanics in search of new examples as test exercises will find the set prepared by Mr. C. E. Inglis (Cambridge University Press, price 2*s.* 6*d.* net) to be of service. There are, in all, 160 exercises, divided into twenty papers; these are chiefly drawn from examination papers set at the Cambridge Engineering Laboratory, and the standard of most of the problems is that of the "A" papers in the Engineering Tripos examinations. Answers to the problems are included, but no hints for solution are given; hence the questions fulfil the purpose of the author, which is to provide material for the student who has learned many principles, but must also gain self-reliance in the application of the knowledge he has acquired. The problems given cover a wide range, and include exercises in structures, machines, strength of materials, and higher applied mechanics generally. The diagrams are well drawn and are clearly dimensioned. Many of the problems bear the stamp of novelty, and are suggestive of others on the same lines. Students preparing for the final engineering examinations of any of the universities should find the book useful.

Engineering for December 8 contains an account of a peat-gas plant which has been working at Portadown, in Ireland, since September last with results which are reported to be quite satisfactory. The plant works with air-dried peat, and consists of two producers of 200 brake-horse-power capacity each, together with coke-scrubber, tar-extractor, sawdust scrubber, exhauster, and expansion box. The peat is fed in block form into a hopper above the producer, whence it falls into the producer itself as combustion proceeds. The gas is drawn off through the coke-scrubber and washer to the tar-extractor, where the tar is extracted under centrifugal action. It then passes on to the sawdust scrubber, and is delivered to the gas-holder by a high-speed fan, which draws it through the plant. The heating value is about 140 British thermal units. This plant has replaced a Mond-gas plant by which power was formerly provided, and figures are given in comparison of the cost of the two methods of power-gas production. The net expense for fuel in the peat-gas plant is 4*l.* 5*s.* per week. The anthracite used in the Mond-gas plant cost 13*l.* 16*s.* 3*d.* per week. The plant has not been running sufficiently long to ascertain definitely whether a slight increase in labour may be necessary; but, allowing 40*l.* per annum for such a contingency, under these conditions at a factory of 500 looms, employing 500 to 600 hands, a saving in the fuel bill of about 438*l.* would result. The plant was constructed by Messrs. Crossley Brothers, Ltd., of Manchester.

A SECOND French edition of the first part of vol. i. of Prof. O. D. Chwolson's "Treatise on Physics" has been published by MM. A. Hermann et Fils, of Paris, at the price of 17 francs. As was the case with the first edition, the translation is the work of M. E. Davaux, and is based on the Russian and German editions. In this case, too, additions and notes have been made by MM. E. and F Cosserat. The previous edition was reviewed in the issue of NATURE for February 15, 1906 (vol. lxxiii., p. 362), to which reference may be made.

OUR ASTRONOMICAL COLUMN.

SCHAUMASSE'S COMET, 1911*h*.—From the Nice and the Arcetri observations of comet 1911*h*, on November 30, December 1 and 2, M. Fayet has calculated a set of elements, which is published in a supplement to No. 4541 of the *Astronomische Nachrichten*. The elements give February 5, 1912, as the date of perihelion passage, and, as will be seen from the extract from the ephemeris, given below, the comet is now getting nearer to both the earth and the sun.

Ephemeris 12*h*. (*M.T. Paris*).

1911	α (true) h. m.	δ (true) ° ′	log r	log Δ	$1/r^2\Delta^2$
Dec. 12	13 55·5	+ 3 6	0·1611	0·2459	0·15
,, 16	14 11·2	+ 2 8	0·1506	0·2352	0·17
,, 18	14 27·2	+ 1 9	0·1403	0·2252	0·19
,, 22	14 35·4	+ 0 39			

The comet is travelling south-east through Virgo, and rises about three o'clock in the morning.

OBSERVATIONS OF COMETS.—In No. 4538 of the *Astronomische Nachrichten* Prof. Barnard publishes the results of his observations of Wolf's periodic comet (1911*a*) during the present return. The observations were made with the Yerkes 40-inch refractor, and show that the magnitude was about 14–15, the diameter from 5″ to 10″, and that the comet was a small and indefinite, although not diffused, object.

Positions of comet 1911*b* (Kiess), determined during July 13 to August 10 at Leipzig, are given by Dr. H. Naumann, who found the comet to be very diffuse and changeable in appearance.

In No. 4539 of the same journal Dr. Backlund discusses the observed and calculated places of Encke's comet (1911*d*) during the present apparition, with special reference to the question of acceleration and the mass of Mercury adopted in calculating the perturbing forces. Prof. Konkoly records the wave-lengths and intensities of the four bands 560, 546, 516, and 472 observed in Brooks's and Beljawsky's comets, showing that the second and fourth of these were relatively faint in Beljawsky's comet